ENVIRONMENTAL PROTECTION AGENCY (EPA Region 9)

California Air Resource Board

Project Title: Investigate the Impacts of Residential Wood Burning on Wintertime PM2.5 Pollution in the San Joaquin Valley of California

CARB Technical Contact:

James Chen **Tel: 916-327-2929**
E-mail: james.chen@arb.ca.gov

Administrative Contact: **Mary Hung** **Tel: 916-324-9907**
E-mail: mary.hung@arb.ca.gov

Funding Awarded: **$75,000**

Completion Date: **April 2020 (estimate, can correspond to the end of budget year)**

Project Description:

The San Joaquin Valley (SJV) of California often exceeds the National Ambient Air Quality Standards for PM2.5 (fine particulate matter with diameter less than or equal to 2.5 micrometer) during wintertime due to enhanced anthropogenic emissions and stagnant meteorological conditions. Since residential wood burning (RWB) is a major contributor to PM2.5 in the SJV during winter, mandatory episodic restrictions have been placed on RWB to improve air quality and to decrease the number of non-attainment days. The proposed research aims to characterize the sources of PM2.5 during winter months in the SJV and evaluate the impacts of the mandatory RWB curtailment program on particulate matter concentration and composition. Specifically, we propose to perform highly time-resolved, in-situ measurements of size-resolved compositions of inorganic and organic components in sub-micrometer particles (PM1) using a high resolution time-of-flight aerosol mass spectrometer (HR-AMS) and offline measurements of PM2.5 concentration and speciation in Fresno, one of the most populated cities in SJV. Detailed analyses of the HR-AMS data will be performed to determine the contributions from wood burning, other primary sources (such as traffic and cooking), and secondary formation processes to wintertime PM pollutants in the SJV. The highly time-resolved PM composition and source apportionment results will be integrated with measurements of gaseous pollutants (e.g., CO, NOx, and O3) and meteorological conditions to determine how RWB restriction influences PM2.5 levels. An existing California Air Resources Board research project funds this work to perform one month of such measurement. The funding from EPA will allow for an additional one month of measurements. The expanded measurements will provide greater coverage of the winter months, when RWB restrictions are in place, and allow for a more robust statistical analysis of the sources of PM2.5 and its contribution from RWB. The results will strengthen the scientific understanding of the nature of SJV's particulate matter problem, the relative contribution of pollution sources and the effectiveness of the RWB curtailment program on reducing ambient PM2.5 levels.